

IN THE CLAIMS:

Claims 1-42 (canceled).

43. (New) A polymer transfer and deposition system comprising:

a polymer plasticating machine for providing a flow of a molten polymer;

a discharge device connected to said plasticating machine containing one or more valves to discharge the molten polymer;

a movable non-rotatable hollow first transport and deposition device separate and independent from said plasticating machine;

said first transport and deposition device including top and bottom walls and a pair of end walls;

an entrance port in said top wall and an exit port in said bottom wall;

said first transport and deposition device when said entrance port is aligned with one of said valves of said discharge device accepting the molten polymer from said plasticating machine;

a ram located within said first transport and deposition device for moving the molten polymer toward said exit port;

a forming device;

a conveyor having a carrier of generally planar shape attached thereto;

drive means for operating said conveyor and thereby moving said first transport and deposition device into alignment with said discharge device and then with said forming device;

said drive means moving said conveyor and carrier to a first position beneath the exit port of said first transport and deposition device where said ram discharges through said exit port a first layer of plasticized molten polymer which is deposited on the carrier; and

said drive means thereafter moving said conveyor and carrier with said first layer of plasticized molten polymer into said forming device which produces an article of a desired shape from the combined carrier and the first layer of plasticized polymer.

44. (New) The polymer transfer and deposition system defined in claim 43, said system including a first robotic device wherein, prior to said conveyor moving the carrier into said forming device, said first robotic device is energized to place an insert on the first layer of plasticized polymer on the carrier;

said conveyor again moving the carrier into a position underneath the exit port of said first transport and deposition device where said ram discharges through said exit port a second layer of plasticized molten polymer which is deposited on the carrier over the insert and the first layer; and

said drive means being effective to operate said conveyor to move the carrier, insert and the first and second layers of plasticized polymer into said forming device to produce an article of a desired shape.

45. (New) The polymer transfer and deposition device defined in claim 44, wherein a second robotic device is located between said first transport and deposition device and said forming device;

an undercarriage provided beneath the carrier to support it during the depositing of the first layer, insert and second layer of plasticized molten polymer on the carrier;

said second robotic device having a vertically mounted robot guide having at the bottom edge thereof a curved surface located in close proximity to said undercarriage and the carrier and the first layer, insert and second layer of plasticized molten polymer;

said robot guide carrying and supporting a surface layer of material;

said drive means being effective to move said undercarriage with the carrier, first layer, insert and second layer of plasticized molten polymer thereon into a

position underneath the curved surface of said robot guide where the surface layer of material is placed by said robot guide over the carrier, insert and layers of polymer;

said robot guide thereafter applying a compressive force between said undercarriage and the surface layer of material, the first layer, insert and second layer and carrier to laminate the layers and carrier together; and

said undercarriage separating from the carrier when the carrier and laminated layers are moved by said conveyor into said forming device.

46. (New) A polymer transfer and deposition system as defined in claim 43, wherein a second transport and deposition device, similar in construction to said first transport and deposition device is provided, said second transport and deposition device containing a plasticized molten polymer, said first transport device being aligned, spaced apart and arranged parallel to said second transport and deposition device;

said drive means being effective to operate said conveyor and to move the carrier with the first layer of plasticized polymer thereon under the exit port of said second transport and deposition device where said ram discharges through said exit port a second layer of plasticized molten polymer over the first layer of plasticized polymer deposited on the carrier.

47. (New) The polymer transfer and deposition system as defined in claim 46, wherein the system includes a first robotic device which when energized places an insert on the first layer of plasticized molten polymer on the carrier prior to the second layer of plasticized molten polymer being placed on the insert and over the first layer, all prior to moving the combined carrier with the insert and deposited layers of plasticized polymer into said forming device to produce an article of a desired shape.

48. (New) The polymer transfer and deposition device defined in claim 47, wherein a second robotic device is located between said first transport and deposition device and said forming device;

an undercarriage provided beneath the carrier to support it during the depositing of the first layer, insert and second layer of plasticized molten polymer on the carrier;

said second robotic device having a vertically mounted robot guide having at the bottom edge thereof a curved surface located in close proximity to said undercarriage and the carrier and the first layer, insert and second layer of plasticized molten polymer;

said robot guide carrying and supporting a surface layer of material;

said drive means being effective to move said undercarriage with the carrier, first layer, insert and second layer of plasticized molten polymer thereon into a position underneath the curved surface of said robot guide where the surface layer of material is placed by said robot guide over the carrier, insert and layers of polymer;

said robot guide thereafter applying a compressive force between said undercarriage and the surface layer of material, the first layer, insert and second layer and carrier to laminate the layers and carrier together; and

said undercarriage separating from the carrier when the carrier and laminated layers are moved by said conveyor into said forming device.

49. (New) The polymer transfer and deposition system as defined in claim 43, wherein said forming device contains a cavity or concave section on one side and a core or convex section on the opposite side where said forming device compresses the carrier and the layer of plasticized polymer into an article of a desired shape.

50. (New) The polymer transfer and deposition system as defined in claim 49, wherein said forming device has at least two formed shapes having matching edges on the concave side when said matching edges are opposite each other, with each matching edge having the carrier side on the matching edge surface where the carrier side edges are sealed together to form a closed container.

51. (New) The polymer transfer and deposition system as defined in claim 43, wherein an undercarriage is provided beneath the carrier to support it during the depositing of the first layer of plasticized molten polymer on the carrier, said undercarriage separating from the carrier when the carrier and first layer of plasticized polymer enters said forming device to produce an article of a desired shape.

52. (New) The polymer transfer and deposition system as defined in claim 51, wherein said undercarriage holds the carrier via a vacuum, with the vacuum being discontinued prior to forming an article of a desired shape in said forming device.

53. (New) The polymer transfer and deposition system as defined in claim 51, wherein said undercarriage holds the carrier with clamps, said clamps separating from the carrier and the first layer of plasticized polymer prior to forming an article of a desired shape in said forming device.

54. (New) A polymer transfer and deposition system comprising:

- a polymer plasticating machine for providing a flow of a molten polymer;
- a discharge device connected to said plasticating machine containing one or more valves to discharge the molten polymer;
- a movable non-rotatable hollow first transport and deposition device separate and independent from said plasticating machine;
- said first transport and deposition device including top and bottom walls and a pair of end walls;
- an entrance port in said top wall and an exit port in said bottom wall;
- said first transport and deposition device when said entrance port is aligned with one of said valves of said discharge device accepting the molten polymer from said plasticating machine;

a ram located within said first transport and deposition device for moving the molten polymer toward said exit port;

a forming device;

a conveyor having a carrier of generally planar shape attached thereto, with the carrier being made from a polyolefin or polyester material of non-woven construction with a weight of at least 0.75 oz./square yard;

drive means for operating said conveyor and thereby moving said first transport and deposition device into alignment with said discharge device and then with said forming device;

said drive means moving said conveyor and carrier to a first position beneath the exit port of said first transport and deposition device where said ram discharges through said exit port a first layer of plasticized molten polymer which is deposited on and adheres to the carrier; and

said drive means thereafter moving said conveyor and carrier with said first layer of plasticized molten polymer into said forming device, with the carrier forming the finish surface of the article produced in said forming device.

55. (New) The polymer transfer and deposition system defined in claim 54, said system including a first robotic device wherein, prior to said conveyor moving the carrier into said forming device, said robotic device is energized to place an insert on the first layer of plasticized polymer on the carrier;

said conveyor again moving the carrier into a position underneath the exit port of said first transport and deposition device where said ram discharges through said exit port a second layer of plasticized molten polymer which is deposited on the carrier over the insert and the first layer; and

said drive means being effective to operate said conveyor to move the carrier, insert and the first and second layers of plasticized polymer into said forming device to produce an article of a desired shape.

56. (New) A polymer transfer and deposition system as defined in claim 54, wherein a second transport and deposition device, similar in construction to said first transport and deposition device is provided, said second transport and deposition device containing a plasticized molten polymer which is different in polymer composition than the polymer in said first transport and deposition device, said first transport and deposition device being aligned, spaced apart and arranged parallel to said second transport and deposition device;

said drive means being effective to operate said conveyor and to move the carrier with the first layer of plasticized polymer thereon under the exit port of said second transport and deposition device to place a second layer of plasticized molten polymer over the first layer of plasticized polymer deposited on the carrier.

57. (New) The polymer transfer and deposition system as defined in claim 56, wherein the system includes a first robotic device which places an insert made from a rigid foam material on the first layer of plasticized molten polymer on the carrier prior to the second layer of plasticized molten polymer being placed on the insert and over the first layer where the insert is encapsulated by the first and second layers, all prior to moving the combined carrier with the insert and deposited layers of plasticized polymer into said forming device to produce an article of a desired shape.

58. (New) The polymer transfer and deposition system as defined in claim 54, wherein said forming device contains a cavity or concave section on one side and a core or convex section on the opposite side where said forming device compresses the carrier and the layer of plasticized polymer into an article of a desired shape.

59. (New) The polymer transfer and deposition system as defined in claim 54, wherein an undercarriage is provided beneath the carrier to support it during the depositing of the first layer of plasticized molten polymer on the carrier, said undercarriage separating from the carrier when the carrier and first layer of plasticized polymer enters said forming device to produce an article of a desired shape.

60. (New) A polymer transfer and deposition system comprising:

a polymer plasticating machine for providing a flow of a molten polymer;

a discharge device connected to said plasticating machine containing one or more valves to discharge the molten polymer;

a movable non-rotatable hollow first transport and deposition device separate and independent from said plasticating machine;

said first transport and deposition device including top and bottom walls and a pair of end walls;

an entrance port in said top wall and an exit port in said bottom wall;

said first transport and deposition device when said entrance port is aligned with one of said valves of said discharge device accepting the molten polymer from said plasticating machine;

a ram located within said first transport and deposition device for moving the molten polymer toward said exit port;

a forming device;

a conveyor having a carrier of generally planar shape attached thereto, with the carrier being made from material taken from the group including a fluoropolymer film, a coated film, and a pre-printed film to provide a specific surface characteristic in the article to be formed in said forming device;

drive means for operating said conveyor and thereby moving said first transport and deposition device into alignment with said discharge device and then with said forming device;

said drive means moving said conveyor and carrier to a first position beneath the exit port of said first transport and deposition device where said ram discharges through said exit port a first layer of plasticized molten polymer which is deposited on and adheres to the carrier; and



said drive means thereafter moving said conveyor and carrier with said first layer of plasticized molten polymer into said forming device which produces an article of a desired shape from the combined carrier and the first layer of plasticized polymer.

61. (New) The polymer transfer and deposition system defined in claim 60, said system including a first robotic device wherein, prior to said conveyor moving the carrier into said forming device, said first robotic device is energized to place an insert made from a material taken from the group including rigid foam, open wall or honeycomb core construction on the first layer of plasticized polymer on the carrier;

said conveyor again moving the carrier into a position underneath the exit port of said first transport and deposition device where said ram discharges through said exit port a second layer of plasticized molten polymer which is deposited on the carrier over the insert and the first layer; and

said drive means being effective to operate said conveyor to move the carrier, insert and the first and second layers of plasticized polymer into said forming device to produce an article of a desired shape.

62. (New) The polymer transfer and deposition device defined in claim 61, wherein a second robotic device is located between said first transport and deposition device and said forming device;

an undercarriage provided beneath the carrier to support it during the depositing of the first layer, insert and second layer of plasticized molten polymer on the carrier;

said second robotic device having a vertically mounted robot guide having at the bottom edge thereof a curved surface located in close proximity to said undercarriage and the carrier and the first layer, insert and second layer of plasticized molten polymer;

said robot guide carrying and supporting a surface layer of material;

said drive means being effective to move said undercarriage with the carrier, first layer, insert and second layer of plasticized molten polymer thereon into a

position underneath the curved surface of said robot guide where the surface layer of material is placed by said robot guide over the carrier, insert and layers of polymer;

said robot guide thereafter applying a compressive force between said undercarriage and the surface layer of material, the first layer, insert and second layer and carrier to laminate the layers and carrier together;

said undercarriage separating from the carrier when the carrier and laminated layers are moved by said conveyor into said forming device.

63. (New) A polymer transfer and deposition system as defined in claim 60, wherein a second transport and deposition device, similar in construction to said first transport and deposition device is provided, said second transport and deposition device containing a plasticized molten polymer, said first transport and deposition device being aligned, spaced apart and arranged parallel to said second transport and deposition device;

said drive means being effective to operate said conveyor and to move the carrier with the first layer of plasticized polymer thereon under the exit port of said second transport and deposition device to place a second layer of plasticized molten polymer over the first layer of plasticized polymer deposited on the carrier.

64. (New) The polymer transfer and deposition system as defined in claim 63, wherein the system includes a robotic device which places an insert made from a material taken from the group including rigid foam, open wall or honeycomb core construction on the first layer of plasticized molten polymer on the carrier prior to the second layer of plasticized polymer being placed on the insert and over the first layer where the insert is encapsulated by the first and second layers, all prior to moving the combined carrier with the insert and deposited layers of plasticized polymer into said forming device to produce an article of a desired shape.

65. (New) The polymer transfer and deposition system as defined in claim 60; wherein said forming device contains a cavity or concave section on one side and a core or convex section on the opposite side where said forming device compresses the carrier and the layer of plasticized polymer into an article of a desired shape.

66. (New) The polymer transfer and deposition system as defined in claim 65, wherein said forming device has at least two formed shapes having matching edges on the concave side when said matching edges are opposite each other, with each matching edge having the carrier side on the matching edge surface where the carrier side edges are sealed together to form a closed container.

67. (New) The polymer transfer and deposition system as defined in claim 60, wherein an undercarriage is provided beneath the carrier to support it during the depositing of the first layer of plasticized molten polymer on the carrier, said undercarriage separating from the carrier when the carrier and first layer of plasticized polymer enters said forming device to produce an article of a desired shape.

68. The method of making a three dimensional product in a forming device comprising the steps of:

- providing a source of a flowable molten polymer;

- directing the molten polymer into a transport device having an inlet port, an outlet port and a ram moveable in the transport device for delivering the molten polymer to the exit port;

- placing a carrier of generally planar shape on a conveyor;

- moving the conveyor and the carrier to a first position beneath the exit port of the transport device;

- energizing the ram so as to discharge through the exit port a first layer of plasticized molten polymer which is deposited on the carrier; and

- moving the conveyor and carrier with the first layer of plasticized molten polymer into said forming device to produce an article of a desired shape.

69. (New) The method of making a three dimensional product in a forming device as defined in claim 68 including prior to moving the conveyor and carrier into the forming device, the step of:

energizing the ram so as to discharge through the exit port a second layer of plasticized molten polymer which is deposited on said first layer and carrier.

70. (New) The method of making a three dimensional product in a forming device as defined in claim 68 including prior to moving the conveyor and carrier into the forming device, the steps of:

placing an insert on the first layer of plasticized molten polymer and carrier; and

energizing the ram so as to discharge through the exit port a second layer of plasticized molten polymer which is deposited over the insert and the first layer and carrier.

71. (New) The method of making a three dimensional product in a forming device as defined in claim 68 including prior to moving the conveyor and carrier into the forming device, the steps of:

placing an insert on the first layer of plasticized molten polymer and carrier;

energizing the ram so as to discharge through the exit port a second layer of plasticized molten polymer which is deposited over the insert and the first layer and carrier;

placing a layer of material over the second layer of plasticized molten polymer; and

applying a compressive force to the carrier and layers to laminate the carrier and layers together.